Green Valley: Recreation Retirement Community & Age Specific Demographic Projection Plan for Green Valley, Arizona

Prepared by
Dennis C. Silva, Jr.

A Masters Report submitted in partial fulfillment
Of the requirements for the degree of

Master of Science
Major: Planning

University of Arizona
College of Architecture, Planning, & Landscape Architecture
Graduate College

1998

Committee Members:
Professor Barbara Becker
Professor Adrian Esparza
Professor Brigitte Waldorf

ACKNOWLEDGEMENTS

I wish to thank the committee members who have contributed academic and logistic support for this report. To Dr. Barbara Becker, thank you for offering me the opportunity to work on this project and providing valuable input and comments. Thank you for the academic and professional advice. I also want to thank the other committee members who have contributed to this report, Dr. Adrian Esparza and Dr. Brigitte Waldorf. I would also like to thank Kenneth Clark and Karen Young for the encouragement and support throughout my graduate studies.

Finally, I owe a debt of gratitude to Phavana, and the rest of my family and friends for their continuous support throughout my academic career. Mahalo!

TABLE OF CONTENTS

TABLES

FIGURES

Chapter 1

Introduction of Retirement Communities

Despite the growing popularity of retirement communities in the United States, there is still skepticism. These developments have been described as "golden ghettos" and referred to as being "socially unnatural" (Hunt et al. 1984). With this kind of criticism, what attracts elderly people to retirement communities? Reasons given for this preference include: the desire of being in a child-free setting; more opportunity for social contact; and, the avoidance of social isolation which often occurs in age-integrated communities. "Similarly, aged migrants to age-segregated retirement communities in Arizona were found to have higher morale than aged migrants living in nearby age-integrated communities" (Hunt et al. 1984, p.2).

Our democratic instincts reject age-segregated communities which may disclose patterns of ageism, or "the internal walls that we build in our society" (Pastalan 1994, p.171). Aging in American society is often perceived as a problem, seen as a nuisance, or a burden that has to be fixed. American society glorifies youth and independence while fearing weakness, disease, and dependency. These attitudes are reflected in several forms of segregation such as: social policies toward elderly people; allocation of resources; planning of services; and, other forms of what Americans regard as solutions to the problem of aging (Pastalan 1994).

Retirement Communities -- Defined

Planned retirement communities have, over the past two to three decades, established

themselves in the United States as a viable housing option for older people. A national study completed in the early 1980s identified nearly 2,400 retirement communities with a total population of nearly 1,000,000 (Hunt et al. 1984). Retirement new towns are defined as communities that are planned and developed for healthy middle and upper-income couples who want a leisurely, but active lifestyle. It also contains at least a moderate amount of commercial and business uses. For the most part, new towns are the creation of private developers and are marketed for young, active retirees (Hunt et al. 1984).

This definition and description coincides with the demographic make-up of Green Valley. While there are other definitions and perspectives of retirement communities, the focus of this study coincides with the Heintz's definition; "... planned, low-density, age-restricted developments, constructed by private capital, and offering extensive recreational services and relatively low cost housing for purchase" (Hunt, et al. 1984, p.3). Green Valley is made up of only single-family homes; it is age restricted; each phase was planned by private developers; and, housing is focused on recreation and social centers clustered around the community.

The population in Green Valley, like other retirement communities, is very homogenous. For some elderly it may be a very satisfying situation. People tend to desire commonality in interests and capabilities or level or styles of living. There are also older people who choose to live in retirement communities simply because they enjoy living and socializing with others their age and participating in organized leisure and recreational activities.

Rise of Retirement Communities in the United States

Retirement communities are not a recent phenomena in the United States. Some date back to the 1920's when various labor, fraternal, and religious organizations acquired relatively inexpensive property in Florida with the intent of creating a supportive living environment for their retiring members (Hunt et al. 1984). The post-World War II era represented a new period of retirement community development, as private builders recognized the potential for marketing homes to a growing population of older Americans.

The popularity of retirement communities in the 1950s was accompanied by a number of studies designed to enhance an understanding of these communities and their residents. While these studies were descriptive in nature and characterized communities according to their population profile and the types of housing and services they offered, several focused on the activities and sentiments of retirement community residents. Hoyt found that most residents (88%) preferred to live in a retirement community where people are retired rather in one where a lot of the people were working. Similarly, aged migrants to retirement communities in Arizona were found to have higher morale than aged migrants living in nearby age-integrated communities.

Retirees cite many reasons for moving to retirement communities. This phenomenon can be best examined by the push-pull model. Push factors are the negative aspects of home and neighborhood and pull factors are the positive attributes which draw people to new communities (Pastalan 1989). Push factors include a sense that one's housing is inadequate such as poor conditions of present housing and aging and changing neighborhoods. Pull factors, the attractive elements of relocating to a retirement community, include companionship, safety, security, and recreational and social activities (Pastalan 1989).

Age Concentration Patterns: States and Regions

Tremendous differences in age concentrations exist across the nation's states and regions. These concentrations changed significantly during the 1980s when the U.S. population was highly mobile. Every state experienced a increase in the number of elderly residents, primarily as a result of the general aging trend. However, the older populations in some states grew at a much faster pace than in others. In an extensive look at the causes and consequences of elderly migration patterns, published in *American Demographics*, Crispell and Frey observed that America's elderly populations are growing in different places for different reasons (MacManus 1996). The young-old (65- to 74-year olds) -- are more likely to move than the old-elderly (75 and older). During the late 1980s and 1990s, they moved to counties in the Sunbelt, the Southwest, and the Rocky Mountains. These regions were attractive because of their low crime rates, unhurried and friendly atmospheres, temperate climates, and other amenities. Generally, retiree movers prefer to relocate to small retirement communities, to the suburbs, and to rural areas rather than to large, densely populated cities or metropolitan areas (MacManus 1996).

This concentration of retirement communities in the Sunbelt is also a phenomena worth discussing. The Sunbelt consists of the states in the South and West of the United States including Hawaii, Southern California (from Santa Barbara south), Arizona, New Mexico, Texas, Arkansas, Louisiana, Mississippi, Alabama, Florida, Georgia, South Carolina, and North Carolina. The Sunbelt is referred to as the new American frontier -- in people, places, politics, and retirement (MacManus 1996). With the lower cost of living, there are more choices in housing and variations in the climate which results in an improved life style.

Composition of Retirement Communities

The mass merchandising of real estate lots and parcels expanded into a multi-billion dollar industry during the 1960s. Sales of vacation and retirement homesites in recreational subdivisions totaled more than $5 billion a year in the early 1970s (Stroud 1995). This section discusses the success of these recreational-retirement communities and their problems as they progress through the stages of development. Positive features of recreational-retirement communities include putting to use land that might otherwise be only marginally productive, thereby boosting rural economies by generating new tax revenues and consumer sales; stimulating the housing construction industry; and, providing recreational opportunities (Stroud 1995).

The success of this industry can be attributed to several factors: the desire of millions of Americans to own land; promotional efforts by land developers; the amenities of a rural environment (pull factor); the desire to escape an urban environment (push factor); the availability of large tracts of relatively inexpensive land located near interstates or major highways; and, the absence of government regulations (Stroud 1995). This explanation describes the situation in Green Valley. It is located outside a relatively large urban environment (Tucson); it is made up of large tracts of land near I-19; and, it is an unincorporated area of Pima County which results in the elimination of certain government regulations.

The negative impacts of recreational land development are directly characterized by the inadequate or lack of land development regulations. The land development boom in recreational retirement communities surprised many rural governments which had no controls

over land use or development standards (Stroud 1995). Many unincorporated areas have no planning or zoning at all to guide the development of these retirement communities. This again characterizes the land development and planning situation in Green Valley.

Chapter 2

Green Valley: Recreational Retirement Community

History of Green Valley

In 1959, when Congress amended the Federal Housing Administration (FHA) Act by adding Section 231 providing federal financial support for housing for senior citizens, the idea for Green Valley began to form. The Maxon Group, spearheading this movement, decided that a warm climate would be preferable for retirees, for reasons of health, ease of living, and pleasure of outdoor living.

Florida, California and Hawaii were considered but several factors argued strongly in favor of the Tucson area. Tucson is statistically the healthiest climate in the United States with the lowest relative humidity and highest incidence of sunshine in the nation (Clizbe 1971). Following a successful scouting trip to Southern Arizona, the Maxon Group had a long discussion with the Tucson FHA office. The timing was optimal since there was a great need for retirement housing along with a congressional mandate for the FHA to support such housing. This type of market situation made a retirement community in the Tucson area a wise planning and investment venture.

The Maxon Group, handling the project on a non-profit basis, were able to attract the interest of the University of Arizona Foundation in acting as a sponsor. The University of Arizona Foundation, although it has no legal connection with the University, exists solely for

the benefit of the University of Arizona, and as such is recognized by the Internal Revenue Service as a non-profit organization.

To control matters connected with Green Valley, the University of Arizona Foundation organized a separate non-profit corporation known as the Retirement Foundation. The function of the Retirement Foundation was to sign, but not mortgage, for the FHA-insured $12,410,000 loan made by the New York State Teachers Retirement Fund (Clizbe, 1971). The plan used the FHA funds to finance a central core of apartments, commercial, and recreational facilities. The construction of Green Valley began in August 1963 with the first apartment ready for occupancy by January 1964.

The Community Recreation Association of Green Valley (CRAGV) was formed in 1967 as a non-profit corporation that promoted the recreation, safety, health, and welfare of Green Valley residents. In the early 1970s, the Community Club of Green Valley was formed. Realizing that these two organizations had similar goals for the community, they merged in 1978 to form Green Valley Recreation (GVR).

GVR as "Shadow Government"

Shadow government is another term for homeowner associations. The Board of Directors of Green Valley Recreation has twelve (12) volunteers from among the GVR membership. The volunteers stand for election to the Board and are voted in by the membership. Each Director is elected for a three-year term with four sitting Directors replaced by new Directors yearly. A Developer Member, representing Fairfield Homes under the Developer Member Agreement, serves on the Board through March 31, 2006. Each Director has one vote. The Executive Director is an ex officio, nonvoting member of the

Board. Each Board Director is expected to chair and/or serve on Board Committees, Task Forces or as an Officer of the Board each year of their term.

Issues come to the Board of Directors of Green Valley Recreation from many sources and are delegated to either a Board Committee or the Executive Director for research and study. Results are reported to the Board with recommendations for action.

The Board Committees and their general responsibilities are:

(1) Board Affairs -- Recommends modifications to GVR policies to help the Board carry out its governing functions; reviews GVR governing documents; coordinates with other GVR committees; ensure the Board has inservice training and orientation programs; and, sees that evaluations of Board processes are conducted.

(2) Bylaws -- Periodically reviews the Articles of Incorporation and the Bylaws for updates and revisions; seeks legal counsel on revisions and presents them to the Board for review; and, action before submitting them to GVR members for approval by ballot.

(3) Elections -- Conducts elections for annual meetings, special meetings, referendums; and, ensures that all election procedures are in accordance with GVR policies.

(4) Fiscal Affairs -- Reviews financial statements and annual budgets; assists in presenting them to the Board of Directors and GVR members; monitors progress toward achievement of annual fiscal objectives; coordinates with the Audit Committee; and, recommends fiscal, investment and financial policies, including amounts of tenant fees, membership dues, initial fees, service fees and assessments.

(5) Nominations -- Presents a slate of candidates to stand for election to the Board; and, introduces candidates to the Board and GVR Members prior to the election.

(6) Planning and Evaluation -- Maintains a Planning System for GVR; and, conducts

market research into demographics, issues, and trends in recreation and education that have an effect on GVR members.

(7) Audit -- A separate committee occupying an oversight role over the financial structure, internal controls, etc. of GVR. With Board approval, the Audit Committee selects and engages an independent public accountant to audit books, records and accounts at the end of each fiscal year.

The organizational structure of GVR indicates that it is a private governmental entity. It holds elections; handles fiscal responsibilities; creates and amends bylaws; and, also includes planning as a focus of the institution. Like other types of businesses, the GVR Board of Directors serves as the elected representatives of the homeowner association and has full legal rights. The Board has a limited lifespan; and, is dedicated to a narrow private purpose -- the protection of property values. In carrying out this purpose, homeowner associations function as private governments.

Latham uses a five-part definition to explain why he characterizes corporations as private governments. His definition fits common interest developments (CIDs) and GVR's Board of Directors as well. The corporation is a political body which exhibits describable characteristics common to all elected bodies. "In a functional view of all such political systems it can be said that there are five essential elements: (1) an authoritative allocation of collective decisions; (2) a symbolic system for the ratification of collective decisions; (3) an operating system of command; (4) a system of rewards and punishments; and, (5) institutions for the enforcement of the common rules" (McKenzie, 1994, p.133). These authoritative allocations of functions is found in the corporate articles of incorporation and other governing documents which determine the purpose of the CID and set forth the distribution of power,

including the Board of Directors' power to further refine the structure by forming committees which are evident in the GVR private governmental structure.

A popular philosophy of utopian ideology is that joint ownership of private property and exclusive group living is a sound community. The Urban Land Institute (ULI) claimed that CIDs were the key to bringing about a grass roots sense of community (McKenzie 1994). This was indeed promoting a utopian ideology for the American middle class. CIDs are the culmination of a particular strain of utopian thought that has its roots in Eighteenth Century England, promoted by powerful real estate interests in the United States in the Twentieth Century.

In essence, the sections of Green Valley that are under GVR's jurisdiction are in the form of a CID. In a CID, everybody who buys a unit automatically becomes a member of the community association. This is also the function of buying a unit in Green Valley. As noted above, GVR's Board of Directors is founded on and governed by certain documents that are related to a state's constitution and set of codes. Typically these include some, or all of a set of covenants; conditions; and restrictions (CCRs) that are tied to the land and are legally binding on present and future owners of the property; articles of incorporation, if the association is incorporated; bylaws; and, rules and regulations (McKenzie 1994). The GVR Board of Directors classifies the institution as a legitimate private government.

The articles of incorporation, similar to those of any other nonprofit corporation, primarily set out the purpose of the corporation/institution to protect and maintain the common areas and enforce the CCRs. The bylaws, rules, and regulations are also written by the Board of Directors which includes a developer member. These documents are every bit as enforceable as the laws, charters, and constitutions of public governments, though new

owners often fail to recognize that fact (McKenzie 1994). Elected directors are responsible for seeing that the dictates of the governing documents are carried out. This includes the maintenance of the common areas and management of all association assets. The funds for maintenance and the Board's other functions come from monthly assessments created for particular purposes. These payments are the "taxes" of the private government and are managed by the Fiscal Affairs Committee in Green Valley. Green Valley's Recreation, like most retirement communities, can be viewed as a private government.

Political scientist, Sanford Lakoff, offers definitions of public and private governments. Like Latham, Lakoff favors viewing homeowner associations as private governments.

"Public governments, on the one hand, are those general as well as special-purpose associations and agencies either to which all inhabitants of a given locality are subject or of which all citizens are members. Private governments, on the other hand, are those limited-purpose associations or organizations, usually voluntary in membership, which exist both alongside and subordinate to public governments. Private associations are considered governments when they exhibit, to a significant extent, certain fundamental political characteristics. In varying degrees and in ways circumscribed by the ultimate coercive sanctions of public governments, private governments exercise power over both members and non-members, often in vital areas of individual and social concern. They make and apply rules affecting and limiting the behavior of members. Often they have well-developed systems of legislation, adjudication and execution, and at least rudimentary electoral and federal systems. In organizational form, they run the gamut from authoritarian to populist" (McKenzie, 1994, p.135).

The legal structure and activities of most CID board of directors coincide with Lakoff's definition of a private government. Their actions touch on what is possibly the most basic human drive -- the desire to exercise control over the immediate environment. The system of command in CIDs tend to be oligarchic (governed by factions), which is consistent with what is generally said about private governments. This differs from the regime based on rights, such as American civil governments. The greatest distinction is that the CID is based

on restrictions.

Planning Implications

The prospects for political action and planning, particularly at the state and local level, could be enhanced by the degree to which CID residents are homogeneous or similar in ways that might contribute to shared political values, interests and attitudes. Critics of CID communities such as Green Valley, and of suburbia in general, often point to what is considered an unhealthy homogeneity of population. This is demonstrated by the concentrations of white, middle-class homeowners in the suburbs and of less affluent, minority renters in the city (McKenzie 1994). The advocates of CIDs are implicitly practicing a form of exclusionary zoning.

A number of sociologists and urbanists have debated the existence and desirability of age, race, and class homogeneity in American suburbs and CIDs. Homogeneous communities deprive people of social resources and thus promote isolation and conflict between residents of the community and the rest of society. Homogeneity in CIDs are not only illustrated in social characteristics but also in the economic realm. CID buyers, as a whole, reflect about the same level of diversity in age, race, and income that exists among homeowners in general. The primary common characteristic of CID purchasers is that they are homeowners, a group that is older, whiter, and wealthier than the general population. "In 1990 the home ownership rate for people below age 24 was only 17.1 percent; and 45.3 percent for those between 25 and 34. Those between 45 and 54 had a home ownership rate of 75.3 percent and those between 55 and 64, a rate of 79.7 percent. Homeowners between 64 and 74 had a homeownership rate of 78.8 percent" (McKenzie, 1994, p.190). Local governments and

urban planners have been grappling with these issues for many years -- trying to achieve more equity in home ownership while discouraging exclusionary communities.

This trend is perpetuated not by public urban planners ignoring the issues, but by CID builders playing the role of private sector planners. Within particular CIDs there is often a high degree of homogeneity because the developments were built with certain groups of buyers in mind. In Green Valley developers, such as Fairfield and Dorn, target certain age groups when planning and developing housing and satellite recreational facilities. Because some parts of the country and sections of metropolitan areas appeal to certain population groups, concentrations of specialty CIDs occur. For example, the network of retirement communities in parts of Florida, California, Arizona, and elsewhere in the sunbelt create substantial concentrated populations of people with similar social characteristics and political concerns (McKenzie 1994). If homeownership rates continue to differ significantly between young and old, white and nonwhite, and class or income status, the potential exists for more reinforcement of exclusion while increasing the probability of political conflict problems in planning.

In short, CID housing represents more than the privatization of certain local government services. It constitutes and facilitates privatization of the land planning functions and the processes which decide where and how people will live in urban areas in the United States. CID communities are the products of privatized policy making. This situation demands the implanting of the public planning process into this privatized planning and development. Without this integration, the homogeneity of CID communities will continue and communities like Green Valley will remain a form of exclusionary land use planning and development.

Conclusion

With the rise in popularity of retirement communities in the United States, it is important to be cognizant of the population and migration increase in regions that are popular for retirees. As shown, the Sunbelt region is known for high retiree migration; and, from a planning perspective, these population and migration increases should be monitored. The accurate determination of future population levels and characteristics is essential for planning activities (Plane 1994). The following section is a demographic projection plan for Green Valley, Arizona. With this plan Green Valley will be able to plan more housing and recreation/social facilities for future retirees that will migrate in the next 10 to 15 years.

Chapter 3

Recreation Planning Issues for Elderly Populations: Green Valley, Arizona Case Study

Introduction

This study is a demographic profile and projection for Green Valley Recreation, Inc. (GVR). GVR is a private, non-profit organization that manages recreation facilities within its political and development boundaries (Figure 3.1). Needs Assessment Surveys were done in 1988, 1991, and 1996. The results of this report will be used for another Needs Assessment Survey beginning in 1998. GVR membership is directly connected to the Covenants Conditions and Restrictions (CCRs) initiated by the developers, Dorn and Fairfield.

Purpose

From a planning perspective, is important to understand the implications of the demographic composition of communities. Different population groups have different needs that can affect land use and housing. For the purpose of GVR, it is imperative that the babyboomer generation is understood and how this demographic cohort group will affect Green Valley in the next 10 to 15 years.

Declining birth rates and longer life expectancies have aged our nation's demographic composition. There is a steadily increasing proportion of the population over the age of 55 with an anticipated surge in this population due to the aging of the babyboomers -- the group in the population born between 1946 to 1964. "The generation born between 1946 and 1964

will help push the median age from the present 32.8 years to 39.1 years in 2035. The first boomers turn 65 in 2011; the last in 2029" (MacManus, 1996, p. 238). Table 3.1 shows the national population figures for the age cohorts 55 to 64, 65 to 74, 75 to 84, and 85 years and over. Note that by the year 2010 the percent of the population for these age cohorts significantly increased, as predicted.

Figure 3.1: Map of Green Valley

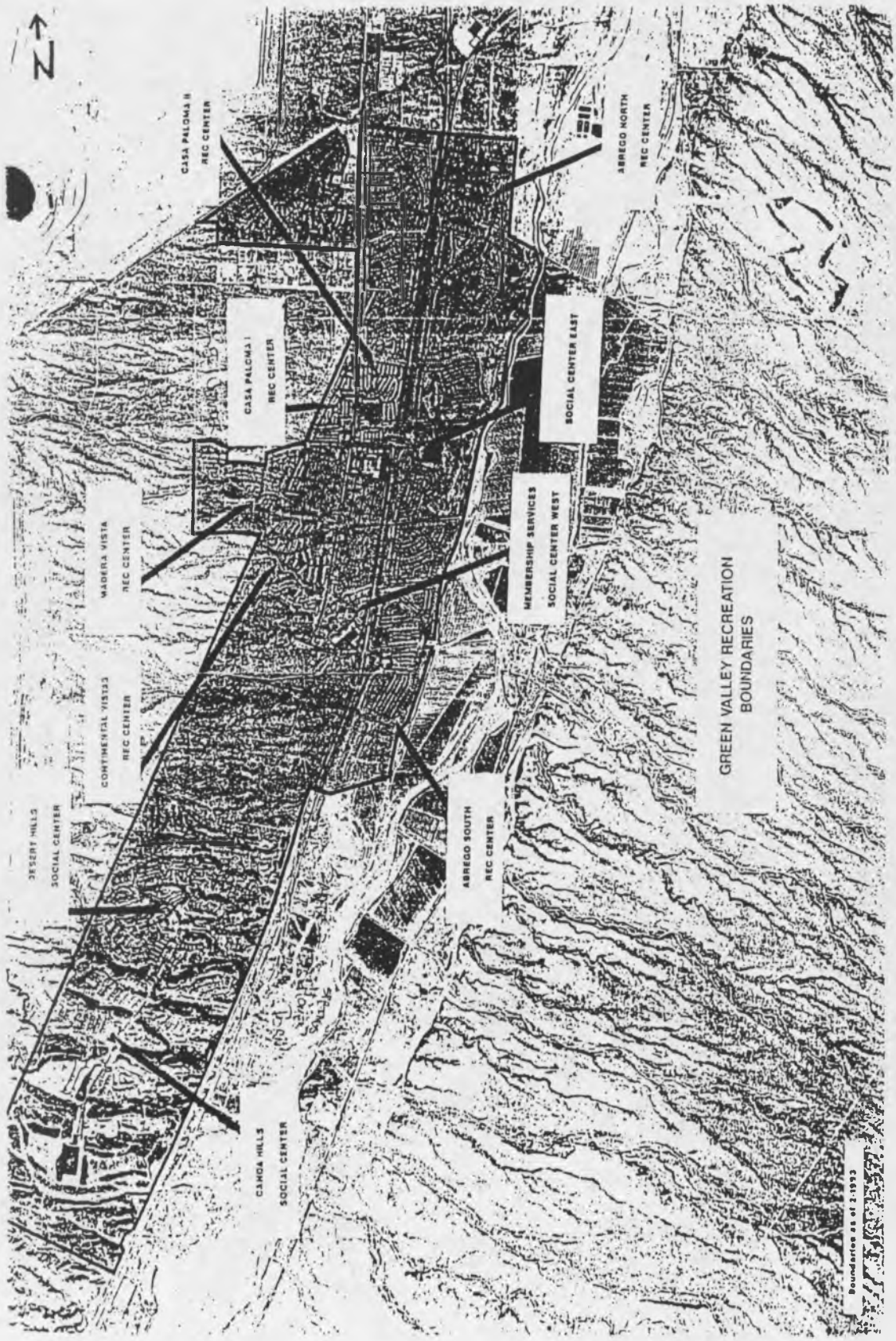

Table 3.1: Actual and Projected Growth of the Older Population, 1940-2010 (in thousands)

	Total Population	55 to 64 Years		65 to 74 Years		75 to 84 Years		85 Years and Over	
Year	all ages	Number	%	Number	%	Number	%	Number	%
1940	131669	10572	8	6375	4.8	2278	1.7	365	0.3
1950	150967	13295	8.8	8415	5.6	3278	2.2	577	0.4
1960	179323	15572	8.7	10997	6.1	4633	2.6	929	0.5
1970	203302	18608	9.2	12447	6.1	6124	3	1409	0.7
1980	226505	21700	9.6	15578	6.9	7727	3.4	2240	1
1990	249657	21051	8.4	18035	7.2	10349	4.1	3313	1.3
2000	267955	23767	8.9	17677	6.6	12318	4.6	4926	1.8
2010	283238	34848	12.3	20318	7.2	12326	4.4	6551	2.3

Source: 1900-1980 U.S. Bureau of the Census, Decennial Censuses of Population. 1990-2050; Bureau of the Census, Projections of the Population of the United States; 1984.

With these national demographic projections, it is inevitable that Green Valley, a substantial retirement community, will experience population growth in the future. It is imperative that GVR remain cognizant of the demographic changes in the population of Green Valley. The purpose of this study is to project future population growth in Green Valley so that plans can be made for this change. Population figures and projections for the state of Arizona is another indication that the age cohort 55+ will substantially increase by 2010 (Table 3.2). Since Arizona is one of the leading retirement areas in the United States today, these figures are particularly relevant to Green Valley and GVR's planning.

Table 3.2: Actual and Projected Growth of Older Population, Arizona

	Total Population	55 to 64 Years		65 to 74 Years		75 to 84 Years		85 Years and Over		55 & Older Percent of Total
Year	all ages	Number	%	Number	%	Number	%	Number	%	Population
1996	4,297,787	338,005	8	340,614	8	205,201	5	60,930	1	22
2000	4,709,844	400,658	9	351,313	7	243,376	5	77,953	2	23
2005	5,209,023	525,833	10	376,594	7	274,900	5	98,740	2	24
2010	5,715,458	664,139	12	448,760	8	283,964	5	121,923	2	27

Source: Arizona Department of Economic Security, Research Administration, Population Statistics Unit. Population Projected by State of Arizona Demographic Cohort-Survival Projection Model.

Goals

Currently there are six recreation centers and four social centers. Two more social centers are being constructed at this time; one to the southeast and one to the northwest. The primary goal is to establish a GVR membership projection through the year 2010. This membership projection, along with a demographic profile, will be useful tools for GVR to match recreation facility and service needs through 2010. "The GVR mission is to contribute to the lifestyle of its members through providing and operating recreation centers, leisure programs, and activities." In order to provide quality recreational needs for its members, GVR must know the demand level for those needs.

Methodology

There is no single method of population estimation and projection that is best for all situations, so choosing a methodology must be based on several situational factors (Raymondo 1992). The cohort-component model is the obvious choice when one requires detailed population estimates for planning purposes. The cohort-component method results in great detail for age and sex population demographic projections.

A Cohort-Survival Model is used for this report. Since GVR provides recreational services for retirees, the age cohorts for this report include: 55 to 59; 60 to 64; 65 to 69; 70 to 74; 75 to 79; and 80 and over. Population projections can be obtained by dealing with two components of population change -- mortality and migration. One of the most straightforward ways to include migration in a population projection is to use age-specific net migration rates in the cohort survival model (Plane 1994). Fertility is not used in this report because of the age cohorts involved. Cohort-component models are extremely useful because they provide

disaggregated population projections by age and sex (Klosterman 1990). As each table is discussed, a step by step explanation of how these population projections were calculated will be given. The assumptions in this cohort-survival model are that migration rates and survival rates are constant. For an explanation of the cohort model refer to Appendix A.

Results

Table 1.3 displays Green Valley's population for 1990 and 1995. The population is determined by using Transportation Analysis Zones (TAZs), which are small units of land used by the Arizona Department of Transportation (ADOT) and Pima Association of Governments Transportation Planning Division (PAG-TPD). The present TAZ system has 635 zones, which means it is about 5.5 times smaller than Census Tracts (115 tracts). Applying smaller units, such as TAZ, results in a more accurate population count. Figure 3.2 illustrates the TAZs overlaying Green Valley.

Figure 3.2: Transportation Analysis Zone/Green Valley Overlay

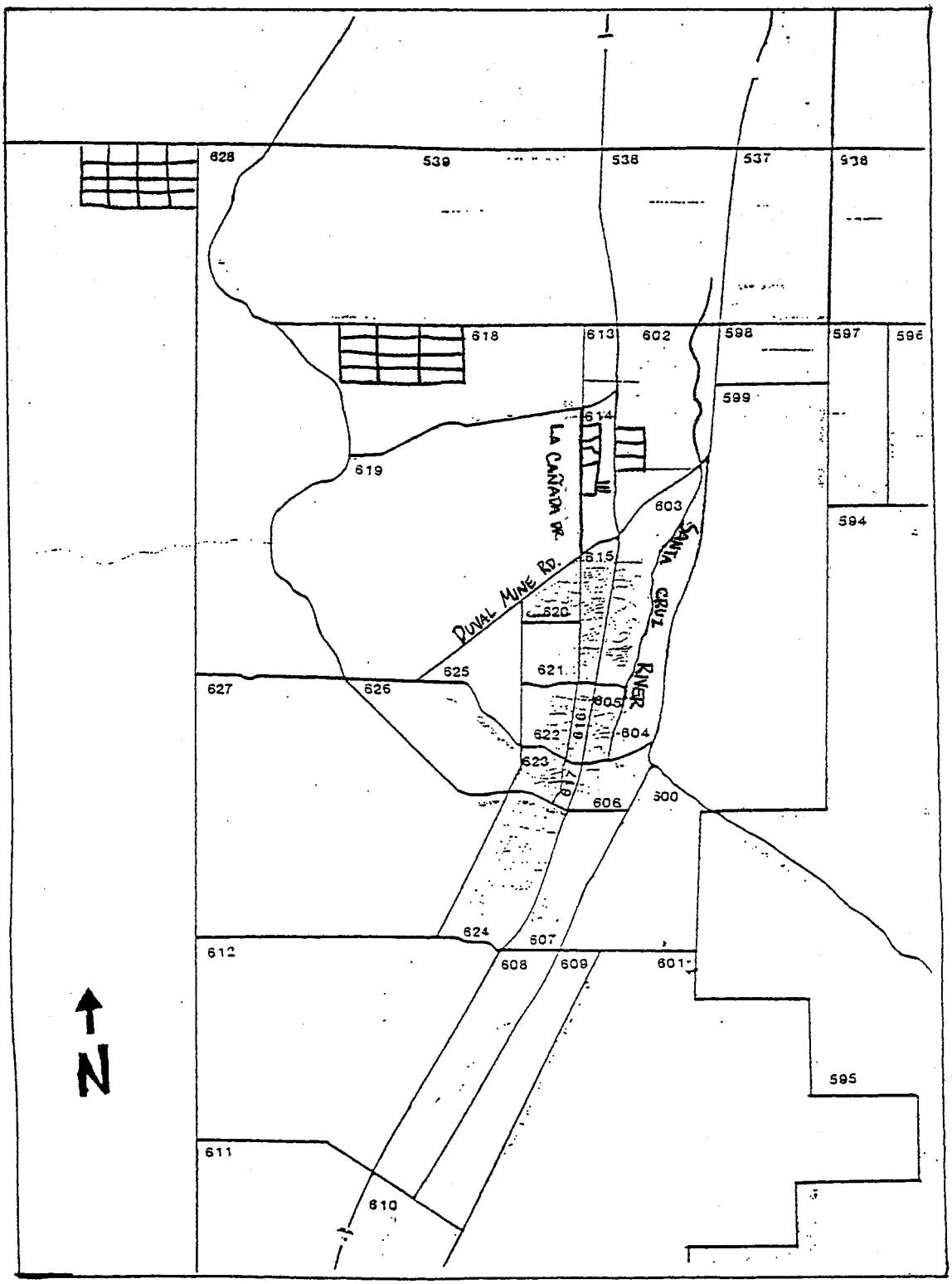

TABLE 3.3 Green Valley Population by TAZ, 1990 & 1995

Transportation Analysis Zone	1990 Population	Dwelling Unit	Population per Household	1995 Population	Dwelling Unit	Population per Household
602	686	216	3.18	449	141	3.18
603	1413	795	1.78	1452	816	1.78
604	334	154	2.17	423	196	2.16
605	1135	692	1.64	1167	712	1.64
606	809	424	1.91	844	442	1.91
607	27	15	1.80	225	125	1.80
612	105	40	2.63	274	105	2.61
613	32	9	3.56	0	0	0.00
614	727	246	2.96	928	305	3.04
615	2154	1140	1.89	2135	1130	1.89
616	605	423	1.43	627	438	1.43
617	55	29	1.90	96	51	1.88
620	1184	649	1.82	1293	710	1.82
621	373	237	1.57	526	335	1.57
622	1846	1125	1.64	1797	1096	1.64
623	223	115	1.94	294	152	1.93
624	3062	1635	1.87	3685	1971	1.87
Total	**14770**	**7944**		**16215**	**8725**	

Source: PAG-TPD, 1995

This historic trend of low population density should continue with present development projections. This table demonstrates that the population density in Green Valley is relatively low both in the present and in projections.

The following tables (Tables 3.4 and 3.5) display the results of the cohort-survival model that project Green Valley's population to the year 2010. Note that 1990's cohort population from 55 to 80 and over account for 80% of the entire population of Green Valley. It is important to note that Green Valley is not an entirely age restricted community, but there are designated subdivisions which are age restricted.

Cohort models are analyzed because it projects an area's population by dividing it into uniform age and sex groups (cohorts) and applying two components of population change -- mortality and migration to each cohort. By considering the two components of demographic

change, age and sex intervals are equal to the length of its age cohorts. Thus, ten-year cohort models project a population at ten-year intervals, and five-year models project a population at five-year intervals. For this report, five-year cohort projection models are used.

TABLE 3.4 Green Valley Population 55 and over, 1990

Age Cohort	Cohort Population	Death in real numbers
55 -- 59	624	3
60 -- 64	1656	15
65 -- 69	2584	39
70 -- 74	3054	92
75 -- 79	2079	85
80 and over	1800	189
Total	**11797**	**423**

Source: Census of Population and Housing, 1990.
Arizona Department of Economic Security, Research Administration, Population Statistics Unit, 1995.

Table 3.5 displays the population projection to 1995 using the cohort-survival components of survival rates, net migration and migration rates.

TABLE 3.5: Components of Green Valley Cohort Population 55 and over, 1995

	FEMALE							
	1990		1-Year	5-Year	1995	1995	Net	Migration
Age Cohort	Cohort Pop	Death	Mortality Rate	Survival Rate	Cohort Pop	Estimated Pop	Migration	Rate
55 -- 59	346	1	0.0029	0.986	334	115	219	1.90
60 -- 64	919	7	0.0076	0.962	862	341	521	1.53
65 -- 69	1434	19	0.0132	0.935	1289	885	404	0.46
70 -- 74	1695	44	0.0260	0.877	1861	1341	520	0.39
75 -- 79	1154	40	0.0347	0.838	1631	1486	145	0.10
80 and over	999	90	0.0901	0.624	1223	967	256	0.26
Total	**6547**	**201**			**7200**	**5136**	**2064**	
	MALE							
	1990		1-Year	5-Year	1995	1995	Net	Migration
Age Cohort	Cohort Pop	Death	Mortality Rate	Survival Rate	Cohort Pop	Estimated Pop	Migration	Rate
55 -- 59	278	2	0.0072	0.965	289	92	197	2.15
60 -- 64	737	8	0.0109	0.947	722	268	454	1.69
65 -- 69	1150	20	0.0174	0.916	1155	698	457	0.66
70 -- 74	1359	48	0.0353	0.835	1443	1053	390	0.37
75 -- 79	925	45	0.0486	0.779	1299	1135	164	0.14
80 and over	801	99	0.1236	0.517	1010	721	289	0.40
Total	**5250**	**222**			**5918**	**3967**	**1951**	

Source: Census of Population and Housing, 1990.
Arizona Department of Economic Security, Research Administration, Population Statistics Unit, 1995

Note that 29% of female population and 33% of the male population change is due to migration. These are relatively high net migration figures and it is important for GVR to recognize this dramatic phenomenon. Although the male cohorts have higher migration rates, their population remains smaller than females because of their lower 5-year survival rates. New migrants require more initial outreach and attention than longer term residents who are well informed on the activities for and restrictions on Green Valley residents.

In the 1990 Census, the U.S. Census Bureau specified Green Valley as a Census

Designated Place (CDP). For statistical purposes, Green Valley was treated as an incorporated city. This proved invaluable to this study since the U.S. Census disaggregated the population into age cohorts.

Table 3.6 and 3.7 shows the 2000 and 2005 population projection based on constant 5-year survival rates and migration rates.

TABLE 3.6: Green Valley Cohort Population Projection 55 and over, 2000

	FEMALE				
	1995	Migration	2000		2000
Age Cohort	Cohort Population	Rate	Estimated Population	Migration	Cohort Population
55 -- 59	334	1.90	402	763	1165
60 -- 64	862	1.53	329	503	832
65 -- 69	1289	0.46	830	379	1209
70 -- 74	1861	0.39	1206	467	1673
75 -- 79	1631	0.10	1632	159	1791
80 and over	1223	0.26	1367	361	1729
Total	**7200**		**5766**	**2632**	**8398**
	MALE				
	1995	Migration	2000		2000
Age Cohort	Cohort Population	Rate	Estimated Population	Migration	Cohort Population
55 -- 59	289	2.15	322	694	1016
60 -- 64	722	1.69	279	472	751
65 -- 69	1155	0.66	684	448	1131
70 -- 74	1443	0.37	1058	391	1449
75 -- 79	1299	0.14	1206	174	1379
80 and over	1010	0.40	1012	406	1418
Total	**5918**		**4560**	**2585**	**7145**
				Total Population	**15543**

The net migration into Green Valley from 1998 to 2010 is projected to increase. By the year 2000, 31% of the female population and 36% of the male population will be the result of net migration into Green Valley. This projected increase appears to be due to the babyboomer impact.

TABLE 3.7: Green Valley Cohort Population Projection 55 and over, 2005

	FEMALE				
Age Cohort	2000 Cohort Population	Migration Rate	2005 Estimated Population	Migration	2005 Cohort Population
55 -- 59	1165	1.90	487	923	1410
60 -- 64	832	1.53	1148	1754	2902
65 -- 69	1209	0.46	801	366	1167
70 -- 74	1673	0.39	1131	438	1569
75 -- 79	1791	0.10	1467	143	1610
80 and over	1729	0.26	1501	397	1898
Total	**8398**		**6535**	**4021**	**10556**
	MALE				
Age Cohort	**2000 Cohort Population**	**Migration Rate**	**2005 Estimated Population**	**Migration**	**2005 Cohort Population**
55 -- 59	1016	2.15	391	841	1232
60 -- 64	751	1.69	980	1659	2639
65 -- 69	1131	0.66	711	466	1176
70 -- 74	1449	0.37	1036	383	1420
75 -- 79	1379	0.14	1211	175	1385
80 and over	1418	0.40	1075	431	1506
Total	**7145**		**5404**	**3955**	**9358**
				Total Population	**19914**

By 2005, 38% of the female population and 42% of the male population will be the result of net migration. For planning purposes, in-migration should be monitored by GVR.

Table 3.8 continues the population projection for Green Valley to the year 2010.

TABLE 3.8: Green Valley Cohort Population Projection, 2010

	FEMALE				
	2005	Migration	2010		2010
Age Cohort	Cohort Population	Rate	Estimated Population	Migration	Cohort Population
55 -- 59	1410	1.90	559	1060	1619
60 -- 64	2902	1.53	1390	2123	3513
65 -- 69	1167	0.46	2793	1277	4070
70 -- 74	1569	0.39	1092	423	1515
75 -- 79	1610	0.10	1376	134	1510
80 and over	1898	0.26	1349	357	1706
Total	**10556**		**8559**	**5374**	**13932**
	MALE				
	2005	Migration	2010		2010
Age Cohort	Cohort Population	Rate	Estimated Population	Migration	Cohort Population
55 -- 59	1232	2.15	448	964	1412
60 -- 64	2639	1.69	1188	2011	3200
65 -- 69	1176	0.66	2499	1637	4135
70 -- 74	1420	0.37	1077	398	1476
75 -- 79	1385	0.14	1186	171	1357
80 and over	1506	0.40	1080	433	1513
Total	**9358**		**7478**	**5615**	**13092**
				Total Population	**27025**

It is important to note the impact of the babyboomer cohorts; 60 to 64 and 65 to 69. These two age cohorts will account for 54% of the female population and 56% of the male population by 2010. With the babyboomer cohorts consisting of such a large proportion of Green Valley's 2010 population, it is imperative that GVR plans and provides recreational needs for this specific group as it will dominate the population.

With the population growth due to the babyboomer population the concern is that Green Valley will experience constraints to growth patterns that are worth mentioning. First,

to the east is the Santa Cruz River, a significant natural resource that should be carefully developed to avoid environmental degradation and is already restricted due to national floodplain regulations. Second, to the north is the incorporated town of Sahuarita. Third, to the west is Madera Canyon, a natural amenity and recreation area that limits the growth pattern of Green Valley. Because of these constraints, the primary direction that Green Valley may grow in the future is to the south. This rationale is demonstrated by the most recent development in Green Valley which is to the south. Canoa Ranch West, which will also have a Recreation Center built along with the new single-family housing developments, begins this southward development.

Chapter 4

Recreation Planning Issues

Recommendations for Green Valley

The elderly population is growing. According to the 1996 Green Valley Needs Assessment Survey, 41% of the respondents are in the combined age cohort of 60 to 69. This is a significantly high enough response rate to represent the views of participants in the GVR programs, services, and facilities. Popular activities for these two age cohorts include fitness/exercise (55%) and swimming/aquatics (58%) (Arizona Opinion 1996). Tables 1.5 and 1.6 show significant increases in these cohort groups by the year 2010. To meet the demands of these new residents, GVR will need to plan for more of these activities and facilities. This does not necessarily mean more recreation centers, but possibly larger fitness/exercise rooms and expansion of existing swimming pools.

There are several ways that Green Valley can meet increasing recreational demands. With the current and future growth constraints, more recreation and/or social centers may not be the feasible solution. Renovating current recreation facilities is a possible solution to growth management in Green Valley. If this renovation and expansion process of current recreation facilities is not feasible, GVR should encourage recreation at home. According to the 1996 Needs Assessment Survey, 34.5% of respondents stated their reason for home recreation as nonparticipation in GVR programs. Future individual housing plans should reflect this demand for greater residential fitness facilities.

Another means of meeting recreational needs can be through greater residential density rather than providing more centers. Best-liked features of GVR recreation facilities

include proximity (62% of the 60 to 64 and 58% of the 65 to 69 age cohorts responded in the affirmative). If this pattern remains consistent, then future residential developments might agglomerate near the current recreation and social centers at a higher density than exists today. Since the majority of residents are projected to be in these two age cohorts, planning to meet the needs and demands should be the focus of GVR in the next 10 to 15 years as more babyboomers migrate to Green Valley. This focus will likely be expressed in either or both the inclusion of fitness facilities in individual residences and/or increased density in close proximity to existing recreational/activity centers.

Conclusion and Implications

This section will discuss ways to diversify recreational activities in Green Valley. Examples from other communities will be illustrated and may also be implemented in Green Valley. Population increase is an important aspect for the planning and decision-making of communities. As populations continue to grow, the need to have an accurate projection of what the population is today and what it is likely to be tomorrow is very important. As mentioned earlier, retirement new towns are designed for retirees interested in both a leisurely and active lifestyle within a self-contained community setting. This characterizes the design and physical profile of Green Valley. These privately built developments, are most commonly found in the Sunbelt and western states so as to take advantage of a climate conductive to year-round outdoor activity. It is important for GVR to be cognizant of the following implications and issues that pertain to retirement new towns today.

New towns are typically the creation of large development corporations owning or holding options on large parcels of land. Generally, they are built in stages. Since retirement

new towns are commonly developed in stages, the character of each stage is largely a reflection of changes in the market and in the developer's philosophy. For the most part, new towns have been able to avoid an increasing average age of their residents. However, with the population projection for Green Valley, the increase in average age of residents will be inevitable because of the babyboomer impact. As a result, services catering to the medical needs of the older retirees have been introduced in many retirement communities in recent years. Herein lies an interesting paradox in the evolution of retirement new towns. The developers feel that introducing nursing and medical facilities in the development process adversely affects the image of an active/recreational retirement community; and, therefore discourages younger and more affluent retirees from moving into the community. Green Valley, like other retirement communities, will have to find solutions between the intended image and the reality of needs of residents based on age within the next ten to fifteen years.

With the inevitable growth of Green Valley, another issue to address is the impact of more subdivision development. Some locations are unsuitable for subdivision development even if sound land use practices are used. Naturally, developers are attracted to prime recreational locations with aesthetically pleasing environments, but many of these beautiful locations cannot withstand the pressure associated with extensive subdivision. "The six states in which over 60 percent of subdivision is occurring -- Arizona, California, Colorado, Florida, New Mexico, and Texas -- possess extensive ecologically fragile areas: mountains, deserts, and wetlands" (Stroud 1995, p.189). These fragile areas are being subdivided, which is the reason for the urgent need for growth management guidelines and regulations. In addition, there must be more focus on the concept of ecological design and planning on the local (recreational retirement community) scale.

Another design and planning implication which Green Valley should consider is toward diversifying outdoor recreational opportunities. Retirees are seeking nonurbanized areas to free themselves from the congestion and crime potential of urban life. Nonurbanized areas represent natural amenities for the retiree. The bottom line on attracting retirees, then, may be convincing them that significant opportunities exist in one's locale for a high quality lifestyle with plenty of social and recreational (indoor and outdoor) opportunities (Valerio 1997).

Green Valley – a highly organized retirement new town located in an area of natural beauty is able to offer recreational opportunities beyond their recreational centers. For example, Madera Canyon is popular for its birdwatching and hiking activities. With these natural resource amenities, it becomes vital for Green Valley to prevent expansive growth since retirees appear to exhibit a dislike for urbanized areas (Valerio 1997). However, successful growth management can lead to even greater demands on the land since protected natural resources remain a significant attraction. If such planning is successful, it is likely that a visiting routine of friends from other places would occur. This occurrence could lead to the eventual establishment of even stronger in-migration to Green Valley.

Viewing retirement communities from the private government spectrum illustrates the schism between suburbanites and central city residents. Many privatized communities, including Green Valley, are organized as CIDs. Charles Murray, a social scientist, views the growth of CIDs as a symbol of the United States becoming a caste society with social separation of the rich from the rest of society (McKenzie 1994). In this scenario it is the rich retirees living in privatized recreational retirement communities which are not totally integrated with the rest of the community. Murray envisions a day when this growing sector

of rich Americans (primarily retirees) will come to view cities as the internal equivalent of Indian reservations (McKenzie 1994). It is important for Green Valley to recognize this issue and prevent exclusionary practices in future planning and growth.

To diminish age segregation, it is important for planners to find ways to integrate the generation gaps, the babyboomers and the younger generation when planning cities and other smaller communities such as Green Valley. A number of communities have experimented successfully with programs that bring the young and the old together. "On one side are programs such as Grandparents in School, which pairs elderly adult tutors (all volunteers) with pre-school and school-aged children" (MacManus 1996, p.253). Green Valley could incorporate a similar program which integrates the elderly with school-aged children in outdoor recreational activities. Since many of the retirees who move to Green Valley seek an active lifestyle, it would be a great opportunity for elderly volunteers to organize guided birdwatching and hiking tours for school-aged children. The benefits of this type of program are twofold: 1) expands the recreational activities that GVR offers retirees; and 2) integrates the generational gaps between the elderly and the young.

Offering more recreational opportunities will benefit GVR by enhancing their marketing through greater recreational activities. As stated earlier, the mission of GVR is to provide recreational and leisure opportunities for its members. Since there is no planning agency or department in Green Valley, it is important for GVR to be cognizant of planning issues related to linking the elderly population with the young population. This focus will overcome the issues of homogeneous character often associated with privatized retirement communities/CIDs.

The true challenge of retirement is not to find activities that simply fill time but to find

activities that are personally fulfilling and lead to a sense of satisfaction (Lamdin 1997). Much of these activities to satisfy and enrich retirees are found on college and university campuses. "In 1972, 8.6 percent of all college students were 25 years or older. By 1988, that percent had grown to 39.1 percent, reflecting an enormous demographic shift" (Lamdin 1997, p.90). With this rapid demographic shift, it is important for universities to be cognizant of retirees returning to school.

Some institutions are beginning to acknowledge their role in satisfying the learning needs of older adults. Over 300 colleges and universities are sponsoring Institutes for Learning in Retirement on their campuses. Some, broadening their vision of the institution as a community learning resource, have opened their doors to the public for free lectures, exhibitions, performances, and discussions (Lamdin 1997). It would be feasible for the University of Arizona to establish this type of program for retirees in Green Valley who wish to pursue further higher education. The benefits of this type of program are twofold: 1) the University of Arizona, by opening their doors, contribute to the possibility of intergenerational learning and understanding; and, 2) younger students can better understand the potential for lifelong learning in their own lives when sitting next to an older person whose comments arise from rich lifelong experience.

The University of North Carolina at Asheville established the Center for Creative Retirement (CCR), one of the most innovative attempts in the United States to both serve an older population and convert it to a community asset. The Center for Creative Retirement draws upon the structure of other Institutes for Learning in Retirement for its College for Seniors, but goes beyond them in a number of important ways. CCR ties itself to the host university not only through shared courses but through its Senior Academy for

Intergenerational Learning (SAIL), which matches retired professionals with university undergraduates as tutors and mentors, thus integrating generations (Lamdin 1997). The University of Arizona could form a similar program by using the model that the University of North Carolina at Asheville has already established. This type of program will keep the retired professional active in university life while mentoring an undergraduate who will learn many important professional and life lessons.

Expanding recreational activities and establishing university programs which integrate retirees with younger students are ways which Green Valley Recreation could expand their recreational program. Table 4.1 represents constructive ways that retirees employ to maintain active and productive lives.

TABLE 4.1: Constructive Retirement Components

Phase	Learning Needs	Major Components	Major Sources
Retirement	employing leisure for better quality of life	re-learning how to learn	self-directed learning schools and colleges
	staying cognitively active	expanding range of skills and knowledge	libraries travel
	achieving sense of purpose	keeping body and mind healthy and active	senior centers fitness, health, & recreation centers book & discussion groups

Source: Lamdin 1997. Elderlearning: New Frontier in an Aging Society.

Table 4.1 is an important information source for GVR because it illustrates what retirees are seeking in their daily lives. Keeping body and mind healthy and active is one of the more significant components and the recommendations discussed earlier coincide with this concept.

Diversifying recreation activities will enhance the Green Valley community. Providing more outdoor recreation, and linking the generational gaps between the old and young through an elderlearning program are ways in which Green Valley could improve their

recreation opportunities. This diversification of activities will lead to a more attractive and dynamic community. New ways of offering recreational opportunities should hopefully shift the population profile away from the homogeneity of retirement communities which prevail at the present time. In the natural environment, diversification leads to stability; this could also be true for the human environment. It is the hope that Green Valley will recognize this phenomena and work toward the objective of diversifying recreational activities.

References

Arizona Department of Economic Security. 1995. *Arizona Population Projections.*

Arizona Opinion. 1996. *Needs Assessment Survey of Members, Green Valley Recreation, Inc., Vol. 1: Executive Summary.*

Arizona Opinion. 1996. *Needs Assessment Survey of Members, Green Valley Recreation, Inc., Vol. 2: Data Commentary and Tables.*

Clizbe, George, ed. 1971. This is Green Valley. Tucson, AZ: Shandling Lithographing Co., Inc.

Dickinson, Peter A. 1978. Sunbelt Retirement: The Complete State-by-State Guide to Retiring in the South and West of the United States. New York, NY: E.P. Dutton.

Dilger, Robert J. 1992. Neighborhood Politics: Residential Community Associations in American Governance. New York, NY: New York University Press.

Garreau, Joel. 1991. Edge City: Life on the New Frontier. New York, NY: Doubleday.

Hayden, Delores. 1984. Redesigning the American Dream: The Future of Housing, Work, and Family Life. New York, NY: W.W. Norton & Company.

Heintz, Katherine. 1976. Retirement Communities: For Adults Only. New Brunswick, NJ: Center for Urban Policy Research.

Hunt, Michael E., et al. 1984. Retirement Communities: An American Original. New York, NY: The Haworth Press.

Klosterman, Richard E. 1990. Community Analysis and Planning Techniques. Maryland: Rowman & Littlefield Publishers, Inc.

Lamdin, Lois and Mary Fugate. 1997. Elderlearning: New Frontier in an Aging Society. Phoenix, Arizona: American Council on Education, Oryx Press.

MacManus, Susan A. 1996. Young v. Old: Generational Conflict in the 21st Century. Boulder, CO: Westview Press.

Malakoff, Laura Z. 1991. Housing Options for the Elderly: The Innovation Process in Community Settings. New York, NY: Garland Publishing.

McKenzie, Evan. 1994. Privatopia: Homeowner Associations and the Rise of Residential Private Government. New Haven, CT: Yale University Press.

Pastalan, Leon A., ed. 1989. The Retirement Community Movement: Contemporary Issues. New York, NY: Haworth Press.

Pastalan, Leon A. and Benyamin Schwarz, eds. 1994. University-Linked Retirement Communities: Student Visions of Eldercare. New York, NY: The Haworth Press.

Plane, David A. and Peter A. Rogerson. 1994. The Geographical Analysis of Population: With Applications to Planning and Business. New York, NY: John Wiley & Sons, Inc.

Raymondo, James C. 1992. Population Estimation and Projection: Methods for Marketing, Demographic, and Planning Personnel. New York, NY: Quorum Books.

Rosenwaike, Ira. 1985. The Extreme Aged in America: A Portrait of an Expanding Population. Wesport, CT: Greenwood Press.

So, Frank S., ed. 1988. The Practice of Local Government Planning, Second Edition. Washington, DC: International City/County Management Association (ICMA).

Stroud, Hubert B. 1995. The Promise of Paradise: Recreational and Retirement Communities in the United States since 1950. Baltimore, MD: Johns Hopkins University Press.

Thornton, James E. and Sharon A. Harold, eds. 1992. Education in the Third Age. Vancouver, Canada: Pacific Educational Press.

United States Advisory Commission on Intergovernmental Relations. 1989. *Residential Community Associations: Private Governments in the Intergovernmental System?*

United States Bureau of Census. 1990. *Census of Population and Housing.*

Valerio, Christy. 1997. Elderly Americans: Where They Choose to Retire. New York, NY: Garland Publishing, Inc.

Winnifrith, Tom and Cyril Barret, eds. 1989. The Philosophy of Leisure. London: MacMillan Press.

Appendix A:
Explanation of Cohort-Survival Model

The Cohort-Survival Model was used to project population in Green Valley to 2010. Below are equations and explanations of how these projections were calculated.

One-year mortality rates were calculated with the following equation:

$d_{as} = (deaths / pop)$, where a is age and s is sex.

The mortality rates can be converted into five-year survival rates:

$s_{5.as} = (1 - d_{as})\text{^}5$.

The next step in arriving at a population projection is to calculate:

$pop_{est} = s_{5.as} \times pop_c$, where pop c is cohort population.

Calculate net migration and migration rate with these two equations:

$net_m = pop_c - pop_{est}$, and

$$rate_m = \frac{net_m}{pop_{est}}$$

The assumptions in this population projection are that the migration rates and 5-year survival rates remain constant. Migration is derived from the equation:

$M = pop_{est} \times rate_m$ where M is migration.

Population projection is calculated by adding migration to the estimated population:

$pop_{proj} = M + pop_{est}$.

Table A-1: Cohort Model Explanation

Age Cohort	FEMALE 1990 Cohort Population	Death	1-Year Death Rate	5-Year Survival Rate	1995 Cohort Population	1995 Estimated Population	Net Migration	Migration Rate
55 -- 59	346	1	0.0029	0.986	334	115	219	1.90
60 -- 64	919	7	0.0076	0.962	862	341	521	1.53
65 -- 69	1434	19	0.0132	0.935	1289	885	404	0.46
70 -- 74	1695	44	0.0260	0.877	1861	1341	520	0.39
75 -- 79	1154	40	0.0347	0.838	1631	1486	145	0.10
80 and over	999	90	0.0901	0.624	1223	967	256	0.26
Total	**6547**	**201**			**7200**	**5136**	**2064**	

Table A-1 will be used as the explanation and reference tool for the cohort-survival model. First, to calculate the 1-year mortality rate, death is divided by cohort population. For example, for the age cohort of 55 to 59, the equation is 1/346 which equates to 0.0029. Second, to calculate the 5-year survival rate, the equation of 1 minus the 1-year survival rate to the fifth power (exponent 5) is used. For example, using the same age cohort (1 - 0.0029) exponent 5 which equates to 0.986. Which means that for the age cohort of 55 to 59, 98.6% survive into the next cohort. To calculate the estimated population for the next 5 years, the equation is cohort population multiplied by the 5-year survival rate of the age cohort. For example, the 1990 age cohort of 55 -- 59 is 346 which is multiplied by 0.986 (the 5-year survival rate of the 55 to 59 age cohort), which equates to the 1995 estimated population of 341 for the 60 to 64 age cohort. Fourth, net migration is calculated by subtracting the estimated population from the 1995 cohort population. For example, in the age cohort of 60 to 64, 862 - 333 equals the net migration of 521. Fifth, to calculate the net migration rate, net migration is divided by estimated population. For example, in the age cohort of 60 to 64, the equation is 521/341 which equals 1.53.

Table A-2 will be used for the population projection section of the cohort-survival

model.

Table A-2: Population Projection Explanation

Age Cohort	5-Year Survival Rate	MALE 2000 Cohort Population	Migration Rate	2005 Estimated Population	Migration	2005 Cohort Population
55 -- 59	0.965	1016	2.15	391	841	1232
60 -- 64	0.947	751	1.69	980	1659	2639
65 -- 69	0.916	1131	0.66	711	466	1176
70 -- 74	0.835	1449	0.37	1036	383	1420
75 -- 79	0.779	1379	0.14	1211	175	1385
80 and over	0.517	1418	0.40	1075	431	1506
Total		**7145**		**5404**	**3955**	**9358**

As stated earlier, the assumptions in this population projection are that the net migration rates and 5-year survival rates remain constant. First, to calculate the 2005 estimated population for the 60 to 64 age cohort, the equation is the 55 to 59 cohort population multiplied by the 5-year survival rate for that age cohort. Thus, the calculation is 1016 x 0.965 = 980. To calculate migration, the estimated population is multiplied by the migration rate. For example, in the 60 to 64 age cohort the equation is 980 x 1.69 = 1659. To project the 2005 cohort population, the estimated population is added to migration. For example, in the 60 to 64 age cohort, the equation is 980 + 1659 = 2639.

These equations were simplified to show how the population projection using the cohort-survival model was calculated. In projecting population using this model, the important statistics are the 5-year survival rates and migration rates.